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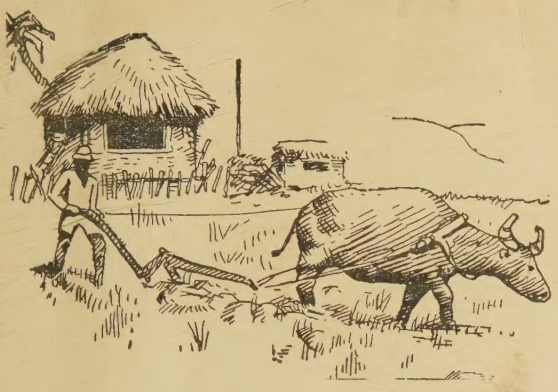

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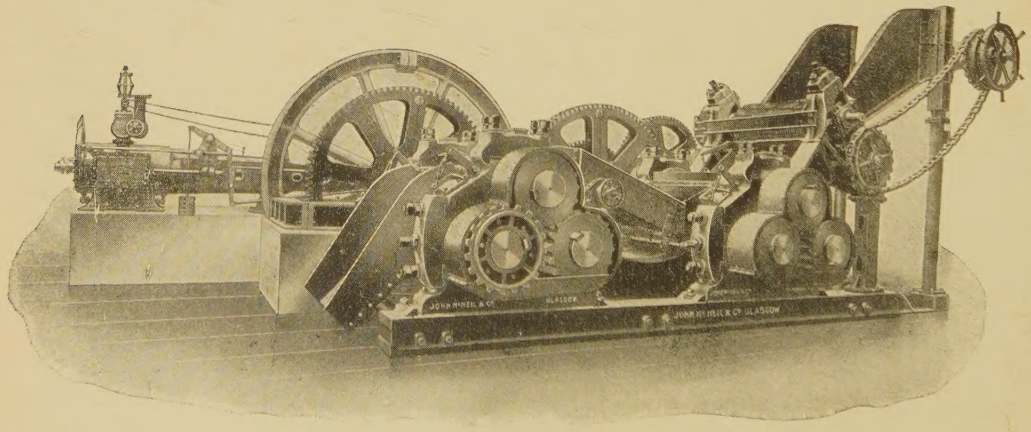

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THE PHILIPPINE AGRICULTURIST AND FORESTER

VOL. I. SEPTEMBER, 1911 No. 7

REPORT ON FIELD AND NURSERY CULTURES FOR THE FISCAL YEAR 1911

MARIANO MANAS, B. S.

(*Continued from August number.*)

FRUIT CROPS

ACHRAS SAPOTA

"Chico":—A tree introduced from Mexico, cultivated for its fruit and also for the gum that is obtained from its bark, called "gum chicle." There is on the farm now a grown chico tree which produced fruit August 30, 1910.

On March 13, 1911, we received 100 seeds of *Achras Sapota* from Vilmorin-Andrieux & Co. These were planted in flat March 15th and germinated with 46 *per cent* germination.

ADANSONIA DIGITATA

"Baobab":—Seed received from Vilmorin-Andrieux & Co. March 13, 1911. It is a tree of large size producing fruits of about the size and form of an ostrich egg, of greenish brown color. This tree is mainly cultivated for the use of the fruits in making sherbet. Our seed were planted in nursery bed immediately after their receipt. Germinated March 29th with 40 *per cent* germination. Transplanted into bamboo pots May 5th.

ANANASSA SATIVA

"Piña or Pineapple:—This plant is much cultivated in the Philippines, for its fruit and also for the fibre it produces. Of the old local variety we have several plants grown since August, 1909, by the temporary College building, some of which have fruited. The weight of one fruit harvested on June 30th was 0.82 kilograms. Three slips from the fruit were collected and immediately planted in the nursery field.

"Natal Canning:"—Five suckers obtained from Lamao Experiment Station December 21, 1910. Planted immediately in the field 1 m. apart, and now growing fairly well.

"Sugar Loaf:"—Ten suckers obtained from Lamao Experiment Station December 21, 1910. Planted immediately in the field 1 meter apart, and now growing well.

"Smooth Cayenne:"—Fifteen suckers received on June 5, 1911, from Hawaii through Mr. H. M. Curran, who collected them there April 25th. Planted immediately in the nursery field 1 meter apart. Only a few of the plants have survived and these are growing slowly.

ANONA RETICULATA

"Anona:"—A small tree that is very common in the Philippines. The fruit has the shape of a bullock's heart, with a sweet, thick, custard-like interior. An anona tree on the farm produced fruit in February, 1911.

September 12, 1910, there were 9 seedlings obtained from Los Baños which were immediately planted in the nursery field. Only six of these plants have survived and grown well up to date.

ANONA SQUAMATA

"Atis:"—A small tree that is very common in the Philippines. The fruit is of the size of an apple. The flesh is custard-like and has a delicious and delicate flavor. September 5, 1910 there were 12 seedlings obtained from San Antonio, Los Baños, which were immediately planted in the nursery field 3 meters apart, and are now growing well. Others were obtained locally at a later date. March 13, 1911, we received 50 grams of seed from India through Vilmorin-Andrieux & Co. One hundred of the seed were immediately planted in the nursery bed 1 dm. by 2 dm. apart. Germinated April 7th with 52 *per cent* germination. The plants are healthy and are now ready to be transplanted to the field.

ANONA MURICATA

"Guanábano:"—A tree common in the Philippines. The fruit is fairly large and of the shape of a heart, with flexible prickles nearly all over it. On September 12, 1910 and January 10, 1911, seed was obtained locally, and immediately planted in flats. Those planted first took about 18 days to germinate, while those planted later took 23 days before germinating. The plants are growing well.

ANONA CHERIMOLIA

"Cherimoya:"—A native of Peru, apparently never established in the Philippines. Seed received March 13, 1911, from Vilmorin-Andrieux & Co. A part of the seed planted in flat May 6th. Germinated May 26th, with 52 *per cent* germination. The plants are in healthy condition, and about ready to be transplanted.

ARTOCARPUS INTEGRIFOLIA

"Nanca:"—There are several nanca trees growing on the farm most of which have been bearing continuously. The average weight per fruit harvested was 14.8 kilograms.

AVERRHOA BILIMBI

"Camias:"—There are two camias trees on the farm which began to fruit March 7th and bore abundantly through the hot season.

CARICA PAPAYA

Zamboanga variety:—Some seeds of this variety were planted in June 1910 in clay pots three plants. Set out into the nursery field September 22nd. Flowers produced March 31, 1911, and fruit set June 4th. The height of the plants is about 2.5 meters, and the fruits are long and fairly large.

Dapitan is famous in the Philippines for its fine papayas, and in many towns it is customary to secure its fruit for seed. In some places, it is positively maintained that seed must be obtained from Dapitan for each crop, as it deteriorates in one generation elsewhere;—which is reasonable enough if no attention is paid to the source of pollen. When fancy strains of papaya began to be imported, the Filipinos promptly gave them the name of Dapitan. There are two main strains of the Dapitan, as of the imported papayas; and each local one is practically identical with the corresponding imported one. The Dapitan papayas no doubt have a common origin with the superior imported strains, but we have not been able to follow their history back.

"Ceylon Long 1189:2:"—One packet of seed obtained from Hawaii Experiment Station October 19, 1910. Planted in flat October 20th. Germinated October 30th, and transplanted into pots November 21st. Set out 116 plants January 9, 1911, 3 m. apart covering an area of 1044 sq. m. Flowers produced April 29th, and fruit commenced to set July 2nd. The height of plants is about 1.57 meters. The plants living are 69 in number giving 59 *per cent* stand. The male plants are 14, or 20 *per cent* of the living plants. The cost of labor on this papaya amounts so far to ₱5.50.

"Ceylon Round 1190:4:"—Packet of seed obtained from Hawaii Experiment Station October 19, 1910. Planted in flat October 20th. Germinated October 30th and transplanted into pots November 5th. Set out 221 plants December 15th, 5 meters apart, covering an area of 1989 sq. m. December 29th., 14 plants that had died were replaced; and again on January 27, 1911. 8 plants were replaced for the same reason, Produced flowers April 19th., and commenced to set fruit June 10th. The height of plants is about 1½ meters and the fruits are fairly round and quite large. The plants living are 178 in number giving 80.5 *per cent* stand. The male plants are 75, or 42 *per cent* of the living plants. There are 64 plants bearing or 40 *per cent* bearing with an average of 9 fruits to a plant. The cost of labor on this variety was ₱23.30.

"Hawaiian:"—Seeds received August 26th, 1910 and planted immediately in flat. Germinated September 2nd; transplanted into pots on September 5th; set out 195 plants December 21st, 3 meters apart covering an area of 1755 sq. m. Produced flowers April 22nd, 1911, and commenced to set fruits June 7th. The height of plants is about 1.34 meters and the fruits are rather small and round. The plants living are 130 in number giving 83 *per cent* stand. The male plants are 52 or 40 *per cent* of the living plants. The cost of labor on this variety so far amounts to ₱11.65.

CARISSA ARDUINA

A thorny shrub which has white jasmine-like flowers and a fruit which is red, and of the size and form of a plum. This fruit is native to South Africa where the Europeans use it for jams. On October 19, 1910, we received from Honolulu seed of this plant which were planted in flat on October 20th. Germinated November 1st; transplanted into pots December 27th. The plants have grown slowly.

CECROPIA PELTATA

A fruit tree belonging to the family of Urticaceae. Seed received March 13, 1911; planted in flat May 2nd, germinating June 9th.

CITRUS FRUITS

Citrus Aurantium. "Calamansi:"—A small variety of orange which is used mainly for flavoring sauce. It is smaller than a plum and when ripe it is very bright yellow in color. There is a young tree growing by the College temporary building. The tree flowered April 10, 1911, and began to fruit April 25th.

"Swatow Orange:"—On November 27, 1910, there were received from Mr. Merrill of the Bureau of Science 9 seedlings of this variety, growing in bamboo pots. One of these plants was transplanted into the nursery field May 3, and it is developing a little better than those still kept in pots.

Citrus Decumana:—A tree with large fruits which is globose with the flesh varying from a pale yellow to red. There is now on the College farm one tree which set fruit March 5, 1911. Fruit harvested May 15th. The fruits are fairly large, weighing 1.1 kilograms each but the pulp is tough and dry.

Citrus Limonum, "Lemon:"—One lemon was received from Mr. Juan Araneta of Occidental Negros through the 1911 Carnival. This fruit is said to be descended from a California cutting brought over by Mr. Beattie about ten years ago. The seed was planted in a flat March 9th; germinated by April 6th; seedlings are now growing well.

Cumquat:—Five seed received September 1, 1910 and planted immediately in pots. Germinated on September 26th with 40 *per cent* germination. At present only one remains alive.

DIOSPYROS DISCOLOR

"Mabolo:"—This tree is cultivated in

the Philippines for its fruit, but produces also the fine cabinet wood known as camagon, or, when especially black, ebony. There are on the campus a few trees nearly grown, and seedlings planted by the foresters.

EUGENIA JAMBOLANA

"*Duhat*:"—There is one duhat tree on the farm which has not yet come to bearing.

EUGENIA MYRTIFOLIA

Seeds received from Paris, March 13, 1911. Sown in flat March 15th and germinated March 24th with 80 *per cent* germination.

GARUGA FLORIBUNDA

"*Abilo*:"—The fruit of this tree is round and fleshy with a hard pit. Seed received from Rizal Province through the Bureau of Science, December 5, 1910. Sown immediately in flat; germinated April 28th. The germination is poor but those that germinated are doing well.

GRAPES

Four seedlings received from Mrs. M. A. Clarke, Manila, April 3, 1911. They were immediately repotted into clay pots and are now doing well.

MULBERRY

For food for its silk worms, the College has a mulberry field occupying about 3400 sq. m. The trees are 1.2 meters apart in rows 3 meters apart. The cuttings were obtained partly from the Bureau of Science and partly from the Lamao Station of the Bureau of Agriculture. It is believed that these, and all other mulberries planted in the Islands within the last few years, since the Government has been encouraging the silk industry, are descended from trees originally growing in the garden of the Philippines Normal School, and probably planted there by Mr. Clute. It is our experience that unless conditions are very favorable it is difficult to make a satisfactory proportion of the young plants stand transplanting to the field; and that therefore, it is better practice to plant the cuttings at stake in the field before they germinate. If the weather and soil are favorable enough to get a good stand by transplanting, a satisfactory stand will likewise be obtained in this way and with decidedly less work. If conditions are not altogether favorable, it will be necessary to fill numerous vacancies, whichever method is used. Our mulberries have been seriously injured by typhoons, and it will probably be found necessary in all districts exposed to these storms to keep a larger area in mulberries than would be necessary in any places where they are not in danger of temporary defoliation. Mulberries fruit readily here if permitted to do so.

JUGLANS AUSTRALIS

"*Walnut*:"—Several seed of this tree were received in 1909 from Buenos Ayres through Dr. Pardo de Tavera. The seeds were planted in the nursery and there is only one growing, which is about 1 meter high at this time.

LANSIUM DOMESTICUM

"*Lanson*:"—There is one young lanson tree on the farm which bore fruit September 5, 1910. September 23rd, seed were obtained and were immediately planted in flat. Germinated September 30th and transplanted into pots November 1st. Part of the seedlings were set out January 13, 1911, 3 meters apart. Those plants all died because of dryness; but there remain some seedlings in the pots which are to be set out in the rains.

MAMMEA AMERICANA

"*Mamee Apple*:"—A tree native of the West Indies, the fruit of which is about

of the shape and size of an apple. The flesh, which is yellow like that of the apricot, is covered on the outside with a leathery skin which easily peals off; inside next the pulp there is another coat which should be removed before eating, as it is bitter. This fruit may be eaten raw, or in a salad, or preserved. No trees of this kind are known in the Philippines. Seed received March 13, 1911 from Vilmorin-Andrieux & Co., and planted in the nursery bed on March 16th. Germinated April 10th, with 30 *per cent* germination.

MANGIFERA INDICA

"Mango."—There were several old trees found growing on the farm. None of these produced fruit in 1909 or 1910. As a result of clearing and burning around it, one of them flowered beginning February 25th, 1910, and set fruit March 15th. The crop was sold on the tree for sixty centavos a hundred. Mango seed were planted in bamboo pots in July, 1910. All germinated and started very well; but later they were attacked by a fungus which killed the majority.

PERSEA GRATISSIMA

"Avocado Pear:"—Two young trees were received November 26th, 1910, from Dr. W. A. McVean, and immediately planted in the field. Only one of these survived and it is now growing fairly well.

GUAVAS

Psidium Guajava:—In spite of Blanco's report of fossil leaves from tuff deposits near Manila, there is little doubt that this is a native of America, which was introduced in the Philippines by the Spaniards. It is thoroughly naturalized and if the expression may be permitted, is one of desirable weed trees on land in the first stage of reversion from cogon to forest. The crop from these wild trees is regularly harvested and marketed by the villagers. There are many such trees on and near the college farm.

Guajava Var. Pyriferum:—Seed was received from Vilmorin-Andrieux & Co., March 13, 1911. A part of the seed planted in flat May 6th. Germinated June 3rd, with a very irregular germination.

PUNICA GRANATUM

"Pome granate:"—21 cuttings obtained from San Antonio, Los Baños, September 7, 1910, and immediately planted in the nursery bed. Two cuttings rooted. These were transplanted into the field December 22nd, and are now growing well.

SAPINDUS SAPONARIA

Seed received from Vilmorin-Andrieux & Co., March 13, 1911. Planted in nursery bed March 15th. Germinated with 90 *per cent* germination up to May 8th. Transplanted May 8th, into bamboo pots where they show good growth. This species grows wild on the farm.

SPONDIAS LUTEA

Seed received from Vilmorin-Andrieux & Co., March 13, 1911. Planted in nursery bed March 16th. Germinated April 4th with 60 *per cent* germination. Transplanted May 8th into bamboo pots, where they show good growth.

SANDORICUM INDICUM

"Santol:"—There are several trees growing on the farm which annually produce abundant fruit, beginning about April.

TAMARINDUS INDICUS

"Sampaloc:"—Tamarind. There are a few trees of this kind growing on the farm, one of which produced abundant fruit beginning January 15, 1911, and continuing through the hot season.

The total cost of labor on miscellaneous orchard crops during the year was ₱2.10

Guajava Var. Pomiferum:—Seed received from Vilmorin-Andrieux & Co., March 13, 1911. A part of the seed planted in flat May 16th. Germinated beginning May 31st, with a very irregular germination.

MISCELLANEOUS TREES

COCOANUTS

There are 878 cocoanut trees, from eight years to eleven years old, on the college farm occupying an area of 3.16 hectares They are under careful observation by the student members of the second year class in Agronomy, reports of which are published elsewhere. 283 trees are infected with Oryctes Rhinoceros (uang); 184 trees are bearing at an average of 9.14 good sized nuts per tree, the selling price of which in Los Baños varies at about ₱3.00 per hundred. The fields have been moderately cleaned giving a total cost of labor during the year of ₱38.85.

CORYPHA SP.

"Buri:"—Seed procured September 29, 1910, and immediately planted in flat. Germinated October 11, transplanted into bamboo pots December 30. Now growing well both in pots and in beds. This plant has a variety of uses which have been listed and described at length by Professor Gibbs in the Philippine Journal of Science.

ARECA CATECHU

"Betel nut Palm:"—There are a number of growing trees of this palm on the farm. Small seedlings were collected in August, 1910. These are now growing well. This plant is in cultivation everywhere in the Philippines for its nuts.

ARENGA SACCHARIFERA

"Caong:"—A considerable number of immature trees are growing on the farm. There are various local uses, the most important of which are roofing and making of cordage. This cordage is very coarse, but is the most durable in use here. The fiber, distinguished as "cabo negro," is in such demand that it is very difficult to protect our trees against the neighbors. In other parts of the Philippines, the plants, beside these uses, serve as a source of starch.

ERYTHOROXYLON COCA

Three young plants received in July, 1909, from Singalong Experiment Station. Planted in full sunlight in hard ground. These plants have not grown rapidly but have developed very compactly and fruited freely at various times, the last being in May, 1911. Cocaine is the product of this plant.

MYRISTICA FRAGRANS

"Nutmeg:"—Plant received from Singapore Botanic Gardens in June, 1910. Planted in the nursery field, and at present growing well.

ACACIA

The various Acacias are cultivated both for their beautiful flowers and foliage.

Acacia Koa:—Seed from Honolulu received from Dr. Foxworthy October 11, 1910; planted in nursery flat October 13th. Germinated October 20th, with a low percentage of germination. Transplanted into pots October 31st where the majority died by "damping off." At present only 3 plants survive.

Acacia Catechu:—Seed received from Paris March 13, 1911. A part of them were soaked and planted in flat May 24th. Germinated May 30th with 4 *per cent* germination.

AFZELIA RHOMBOIDEA

"Tindalo:"—A native Leguminous tree with large pods and red seeds. Its main use is for its valuable timber. There is now found on the farm an old tindalo tree from which 2 pods containing 9 seed were gathered March 7, 1911. The seed were dried and planted April 10th; all germinat-

ed on or about April 28th. On May 25th the seedlings were set out along the main road of the farm, 15 meters apart. An attempt to reproduce tindalo by cuttings was unsuccessful.

SWIETENIA MAHOGANI:

Seed obtained March 13, 1911, from Vilmorin-Andrieux & Co. Planted immediately in flats; germinated April 6 with 4 *per cent* germination. Growing now in bamboo pots. Experience in other tropical countries makes it probable that mahogany would be a very desirable tree for road side planting in the Philippines, and it is not impossible that it could be used to excellent purpose in the reforestation of waste land.

STRYCHNOS NUX-VOMICA

Seed received March 13, 1911, from Vilmorin-Andrieux & Co. Planted in flat March 14; germinated April 19 with 25 per cent germination. Transplanted into field, spaced 3 meters each way. Now growing satisfactorily. This plant is the usual source of strychnine.

STRYCHNOS IGNATII

(*Saint Ignatius' Bean*:)—A native of Samar; in wide use in the Philippines as a medicine and as a poison. Fruit was obtained from the Samar Exhibit at the last Carnival. Germination of the seed is exceedingly slow and irregular, but a few plants are now growing satisfactorily.

MORINGA PTERYGOSPERMA

"*Horseradish-Tree*:"—Seed received from Vilmorin-Andrieux & Co., March 13, 1911. Planted in flat March 15th. Germinated March 20th, with 71 *per cent* germination. Transplanted into bamboo pots on May 5th. Then set out in the field, 4 meters apart. They are now well established in the ground. They produce roots which are eaten as a substitute for horseradish while the pods that they bear are boiled while tender and served at table, tasting like Asparagus. Oil of Ben is made from the seed. A few trees of this kind are already grown at Los Baños.

ALEURITES TRISPERMA

A few seed obtained from Maragondong. Two plants are now living and are about 88 cm. high.

ALEURITES MOLUCCANA

"*Lumbang*:"—Seed received from Tarlac March 2, 1911. Planted in pots April 10th, germinating April 25th with 40 *per cent* germination. Transplanted into the field June 29th. There are old trees on the farm, which seed freely. A good tree is valued at three pesos a year.

ALEURITES CORDATA

Seed received March 13, 1911, from Vilmorin-Andrieux & Co., Planted in nursery flat March 16th. Germinated April 7th with 20 *per cent* germination.

BIXA ORELLANA

"*Achuete*:"—This shrub is commonly grown in the Philippines for its red seeds, which are used for coloring food, etc. There is on the farm one young plant which is growing well.

CANANGA ODORATA

"*Ilang-Ilang*:"—Seeds of this valuable flowering tree were secured from Manila June 2, 1911, and immediately planted in the nursery bed. Germinated February 2nd with about 88 *per cent* germination.

MICHELIA CHAMPACA

A young plant obtained from Manila January 2, 1911. Planted in the nursery field and now growing well. Champaca is grown in Manila and is being planted on a considerable scale, the flowers being used for the manufacture of an essential oil which

is used as a base of perfumery. There are two varieties; with white and yellow flowers. The one with yellow flowers is the more valuable.

JASMINUM SAMBAC

"*Sampaguita*:"—Cuttings made in Los Baños August 18, 1910. Planted in nursery bed; rooted September 17; transplanted to field October 12. This plant also promises to have industrial value as a source of perfume. It is very popular locally because of its odor.

LUMBERING IN BATAAN

FELIX FRANCO

It is thru capital that most of our forests are exploited on a large scale, and this is the only way by which the Philippine people may be able to make use of their wealth which has been accumulating in the forests year after year for centuries.

At present there are only three big companies in the Islands, the Insular Lumber Company which is working in Negros, the Philippine Negros Co. of Negros, and Cadwallader & Gibson Lumber Company, which works under a twenty-year concession in Bataan. The following will be a discussion of the work as carried on by the latter company in Bataan.

The concession is a large tract in Bataan, which is well covered with the species belonging to two Dipterocarp forest types, the lauan-apitong type and the tanguile type. It is a broken country of parallel hills with many deep valleys and swift narrow streams on whose banks there is thick growth of climbing bamboos and rattans. This renders the passage thru the forest and from one hill to another very difficult. In parts of the lauan-apitong type the undergrowth is nothing more than clumps of bojos and at first sight you will be led to think that you are in a monocotyledonous forest which might be very profitable to a pulp-manufacturer. But among the bojos the veteran palosapis or mayapis (*Anisoptera thurifera*), guijo (*Shorea guiso*), Apitong (*Dipterocarpus grandiflorus*) and many other species of different families are scattered.

The thick growth of bojos makes the work more difficult and more expensive, for it requires a large number of men to do the swamping and clearing on the logging area, specially along the line of the back-haul and in-haul cables. Higher above on the ridges the stand is less complex, denser with less undergrowth.

While the logging is in the forest seven or eight kilometers inland, milling is done in the sawmill situated on the bank of Manila Bay near the mouth of Limay River, where the barges can be easily loaded with sawn lumber.

There are three parties in the forest. Each party is composed of two crews, the felling and bucking crews. There are six men in the first, two of which are axemen. The two axemen are better known as undercutters, for they make the undercuts and decide which way the trees fall. The remaining four work with the cross cut saws and follow the undercutters to complete the felling. A party of this size can cut as many as fifteen or twenty trees of regular size (about 40 cm. in diameter) in one day's time but not more than four trees whose diameter is at least a meter. The number of trees that could be felled also depends on the species, decreasing in number as the number of resinous trees cut increases, because they need to oil the saw many times to prevent it from getting very thickly coated with the resin.

The bucking crew of eight men, working with four two-handed cross cut saws comes

after the fellers and cuts the felled trees into logs of different lengths, ranging from 5 to 11 meters, according to the description of the logging-boss. The number of logs that the buckers could cut also depends upon the size and species of trees felled.

The skidding is done by steam. There are three donkey engines, two of which are employed both for skidding and loading, while the one is used only in hauling the logs from the farthest end of the cutting area.

The skidding operation is carried on by a small number of men. There are for each donkey only one engineer, two firemen, two choker-men, five swampers, three hooktenders and one signal man. The engine is provided with two drums, where the in-haul and back-haul cables run independently. The two cables are connected at the end, so that the back-haul cable which is more than three times as long as the in-haul, reels in when the in-haul cable goes out in the forest to get the logs. The two cables run in the forest in a complete circle thru big pulleys and blocks. The two cables are made of steel wire. The in-haul cable is $\frac{5}{8}$ inch and the other is a little smaller.

The in-haul cable is provided with hooks in two or three places near the end where the chokers can be attached. When the in-haul reaches the top, the choker-man anounces with a shout that the cable should stop, and the signal man communicates this to the engineer by means of a long wire connected to the whistle of the engine. Different numbers of whistles have different meanings. The choker-man puts the choker around the log and connects it with the in-haul cables when the signal man immediately gives the signal to the engineer to pull. The hooktenders follow the log as it goes along and have to detach the choker from the cable as blocks are reached. Here the log has to stop many times in places when it meets some obstruction on its way, such as old stumps, bamboo clumps or another log. Altho four or five men are constantly working to clean the skidway all the time it is very difficult to help the moving log from meeting obstructions.

Another set of men is stationed at the landing to look after the logs on the landing. The engineer runs the gear and the men which are eight in number manage the landing. They tie the log at one end and then let the gear pull it toward the cars. The engineer lets the cable loose and they change the place of the choker to the middle of the log, so as to balance the log on the cable when it is pulled up again. When the log gets parallel with the cars it is dropped down. The men fix the car in such a way as to prevent the logs from falling off the cars. The numbers of logs in a car vary from one to five, but usually three are put on one car.

When four cars are loaded the men get on the cars and a locomotive brings them to the first Station which is about a kilometer from the landing. Here another locomotive, bringing the other set of empty cars, takes the loaded train down to the sawmill after leaving the empty one on switch. The first locomotive takes the cars to the forest with another set of men to load them. The two trains make at least four trips every day.

When the train reaches the mill the same men that loaded the train will unload it. This is done in the same way as the loading. A gear run by a big donkey situated near the railroad track. The men take the cable suspended from the gear pulley and fasten it to the logs. The gear lifts the logs one by one, swings them to one side and puts them on the ground.

Another donkey far on the other side of the yard sends its cable out to put these logs in the file. A small engine is mounted just behind the band-saw. This has to get logs from the file and land them on the deck to supply the saw.

In front of the band-saw a carriage runs back and forth on a track with great speed. Four men are riding on the carriage, three doggers and one setter. The work of the doggers is to load the carriage with the help of an over-head cable which takes the place of a nigger and to hold the log forward or bring it back a certain distance, according to the instruction given them by the sawyer. The sawyer is the most important man in the whole mill. He manages the speed of the carriage and decides how the log must be sawn.

Just behind the saw and parallel to the carriage track is a long bench with live rollers. As soon as the boards fall on the live rollers they continue to move toward the edger. Here the edging party takes them as fast as they come and passes them thru the edger, to convert them into narrow boards and to take away the edgings.

On both sides of the edger there are two slab-slashers provided with single circular saws. Each one is run by two men, who take the slabs and cut them in short pieces for fuel. The edged boards pass on to the back part of the building where they are finally trimmed or cut into short boards of all lengths. Trimming is done by four men. The trimmer is a circular saw pivoted above and run by a belt. It is not a bit different from the slab-slasher.

Six men wait behind the trimmer and sort the boards into different classes and species. They pile them on supports about a meter from the ground to season well under the sun. Others are taken to the kiln to be seasoned quickly by artificial heat from the boiler.

Most of the lumber is taken to the barges before being seasoned and is brought to Manila by a steamer.

Individual Exhibits at the Philippines Exposition

The Exposition Board has taken definite action offering medals and diplomas for individual exhibits at the coming exposition. The best exhibit of each kind will be awarded a gold medal, and really worthy exhibits other than those awarded medals will be given diplomas of honorable mention. The rules governing competition for these medals are as follows:

1. Of each article, approximately the specified amount must be exhibited. If much less than this is exhibited, the article will not be considered in awarding the medals.

2. Each article exhibited is expected to be the product of the exhibitor. It must be his property. Articles purchased by the provincial board for exhibition may not compete for medals.

3. Articles competing for these medlas will be received by the authorities preparing the several provincial exhibits, and will be taken care of by them as other exhibits are cared for; this care includes bringing to Manila, exhibition and return. These articles will be given places of proper prominence.

4. Articles competing for medals shall be labeled like other exhibits, but the label of each shall be surcharged "Competitive Exhibit". Surcharging of labels may be done with a stamp which will be provided for the purpose, when the exhibits reach Manila.

5. Each article exhibited for a medal shall be for sale, at its full market value, to the Exposition Board. The Board will exercise the right to purchase only in the cases of articles desired for the Philippines Museum.

The Exposition Board is anxious to give this matter the widest possible publicity for the following reasons:

Whatever private exhibits are made are a free addition to whatever the provincial authorities are able to collect.

Aside from the honors which may or may not be awarded to any provincial exhibit as a whole, the province will be honored and advertised by the medals earned by its citizens in this open competition.

Private exhibitors will have a greater interest in the exposition than a purely official exhibit can hope to arouse. Whatever increases interest in the exposition must increase its value.

It is possible for every farmer in these Islands to produce better articles, if he deliberately sets out to show what he can do, than he ever prepares for the market. At past carnivals, practically nothing exhibited had been raised and prepared for the purpose. The time remaining this year will not permit most products to be raised for this purpose. But it is to be understood that this competition for prizes is a permanent institution, and that the range of exhibits for which medals are offered will be extended. Any farmer may begin now to prepare for the exposition a year ahead, with full confidence that he will have a chance to enter his produce in competition with the farmers of the Archipelago, with medals for the winners. It is evident that if many people are interested in such competition, each province will be able to make an exhibit far more creditable than is now possible.

It is obvious that such competition, in the measure in which people become interested in it, will raise the standards of agricultural practice and the quality of Philippine products. This is the most important purpose of the exposition.

— — —

The list of articles for which medals and diplomas are offered this year are as follows:

PRIZES TO GROWERS

Coconuts.
- Best 5 seed nuts.
- Most copra from one nut.
- Copra sample richest in oil; 1 kg.
- Best cured picul of copra.
- Best sample of oil; 1 liter.
- Best sample of coir.

Abacá: Samples of at least 1 kg. each.
- Longest fiber.
- Strongest fiber.
- Finest fiber.
- Best fiber; 10 kg.
- Best prepared hat-making fiber; 500 g.

Maguey: best sample, at least 1 kg.

Tobacco: Samples of one hand each.
- Best wrapper leaf.
- Best plug tobacco leaf.
- Best cured.
- Largest sound leaves, 5.

Sugar: exhibits of five stalks.
- Heaviest cane.
- Best purple cane.
- Best green or yellow cane.
- Best stripped cane.
- Best assortment of varieties.
- Best sugar ready for market, in container.
- Best panocha.
- Best molasses.

Coffee: best sample, 1 kg.

Cacao: best sample, 1 kg.

Rice: samples of 2 liters, hulled.
- Best paddy rice
- Best upland rice.
- Best glutinous rice. (Malagquit).
- Best pinipig.
- Heaviest ganta of palay.
- Heaviest five heads of grain, in head.

Maize.
- Best exhibit of five ears.

Heaviest liter, shelled.
Best stalk with ears.
Millet: best exhibit of ten heads.
Sesamum: best liter of seed.
Forage grass: best 10 kg., green.
Indigo: best sample, 1 kg.
Rubber: best sample, at least 200 g.
Manioc.
  Best display of roots.
  Best starch, 1 kg.
Arrowroot: best starch, 1 kg.
Tacca (Yabyaban): best starch, 1 kg.
Sweet potatoes: best exhibit.
Yams: best exhibit.
Garden truck: at least 1 kg.
  Egg plant.
  Tomato.
  Chili.
  Potato.
  Squashes and gourds.
  Sweet corn.
  Cincamas.
  Radishes.
  Best general exhibit.
Fruit: at least 1 kg.
  Banana.
  Citrus fruit.
  Papaya.

Provincial Displays.

Best display, coconuts and products.
" " , abaca " "
" " , tobacco industry.
" " , sugar industry.
" " , rice varieties, each to be shown in head and hulled.
Best display of fruit.

Black Pepper in Batangas

FLORENCIO BAGUI

Black pepper (*Piper nigrum, L*) thrives and does its best in a warm country, with moderate showers, where there is plenty of sunshine; it also thrives well when it is shaded. As a rule *nanca* is used for this purpose. In localities where the dry season lasts six months, and the yearly rainfall is scarcely more than a meter, black pepper gives a good yield only when irrigated.

Clayey soil with admixture of humus is considered good for black pepper. The yield is greatly improved, both as to the quality and quaintity, when the plant is manured.

Cattle or horse manure is usually used. In the East Indies, burned soil is considered a good fertilizer for this plant. I have observed that black pepper, when fertilized with cattle manure, produces berries at least one year earlier, than when not manured.

The annual yield of a good sized plant is estimated as one "chupa" or a little over. The plant begins to fruit in October or November, and the berries are harvested from December to January. The berries are picked out while still red in color and then dried before use, or before putting on the market.

Black pepper is usually propagated by cutting, branches being cut close to some node, care being taken to disturb the suckers as little as possible. The plant needs support, and coconut trees will serve the purpose very well. Black pepper then is a good catch crop in coconut groves.

Pepper may produce berries three years after planting, but such berries are of no commercial value. Only after seven years this plant produce a saleable crop.

Black pepper was formerly extensively cultivated in several localities of Batangas. But at present only individual plants can be found, the produce from which is used for home consumption.

The Philippine Agriculturist and Forester

Organ of the Student Body of the Philippine College of Agriculture Published Monthly During the School-year

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AGRICULTURAL EXHIBITS

In our second number, published last February, we advocated with what vigor we could put into the words a change in the policy of the Philippines Carnival or Exposition to the effect that at future shows of this kind prizes should be offered for agricultural exhibits to the individual farmers of the Islands. As will be seen in another column, the Exposition Board has now taken the action which we recommended. The announcement comes so late that most of the articles for which medals are offered can no longer be raised, for this year's exposition, especially for this purpose. However, there is still a chance to raise some of them, and for the rest there is an opportunity for the planters to exhibit the best they have. The main thing this year is arousing the attention and interest of the farmers. If representative men, well scattered through the Islands, receive the medals which are offered this year, they will assuredly return next year with better exhibits than they make this time, and in many cases their neighbors will be here with them.

The government has done its part in providing the medals and diplomas, and offering to award them to the best exhibitors. It remains for the farmers of the Philippines to respond by coming after what is given, and doing their best to prepare worthy exhibits.

SEPTEMBER

Date	Rainfall.		TEMPERATURE Maximum		Minimum	
	Inches	Mm.				
1			30.6°		26.7°	27.5
2	0.02	0.51	31.9°		24.3°	25.0
3			32.0°		22.6°	23.2
4			30.8°	29.0	22.7°	22.4
5			30.5°	31.0	22.9°	23.3
6			30.7°	31.0	23.0°	24.4
7			30.1°	30.8	23.0°	24.5
8	0.09	2.29	30.5°	31.7	23.9°	25.0
9			30.5°	31.0	23.7°	24.4
10	0.08	2.03	27.0°	30.5	23.2°	24.5
11	0.00		29.0°	29.0	24.0°	25.0
12	0.05	1.27	30.0°	30.1	23.0°	23.5
13			32.0°	31.7	23.3°	24.3
14			31.9°	32.0	23.9°	24.0
15			31.8°	32.0	23.7°	24.0
16			32.2°	32.0	24.5°	24.5
17			31.3°	29.9	26.0°	26.5
18	0.40	10.16	29.0°	31.8	23.4°	24.8
19	0.10	2.54	30.5°	32.0	23.9°	24.6
20	0.95	24.13	32.9°	32.1	24.0°	25.0
21	0.20	5.08	30.5°	30.3	23.9°	25.4
22	1.31	31.27	29.5°	29.8	23.5°	25.2
23			32.2°	31.7	23.7°	24.5
24	0.06	1.52	31.4°	31.3	23.4°	24.4
25			32.0°	27.4	24.0°	25.0
26			32.1°	31.5	24.5°	27.0
27			29.5°	29.4	25.9°	27.0
28	0.51	12.95	30.5°	30.0	25.0°	25.9
29	1.02	25.91	27.6°	27.0	23.9°	25.0
30	0.33	8.38	30.0°	29.6	24.8°	24.8
Total	5.12	128.04				

Scale of Points for Philippine Pony

The classes of Animal Husbandry of the College have adopted the following scale of points:

General Appearance.

- Form, Symmetrical, Smooth, Stylish 4
- Quality, Bone, clean, firm, indicating good substance; tendons, prominent and defined; hair and skin fine showing good texture.... 4
- Temperament 7
- Active, kind disposition 2

Weight .....

- Not less than 250 kilos..... 3

Head and Neck.

- Head, lean and straight..... ½
- Muzzle, fine, nostril large, lips thin, even sound teeth..... ½
- Eyes, full, bright, clear, large, expressive..... ½
- Forehead, broad, full..... ½
- Ears, medium size, pointed, well carried, not far apart. ½
- Neck, muscular, crest high; throat latch, fine; windpipe, large..... ½

Fore Quarters.

- Shoulders, long, smooth, muscular, extending into the back..... 2
- Arms, short, not thrown too far forward..... 1
- Forearms, muscular, long, wide..... 2
- Knees, strongly supported, clean, wide, straight and deep..... 3
- Cannons, short, wide, sinews set back..... 1
- Fetlocks, wide, straight... ½
- Pasterns, strong, angle with ground 45 degrees..... ½
- Feet, dense horn, strong bars, concave sole, large frog..... 3
- Legs, from in front, a perpendicular line from the center of the shoulder joint should equally divide the knee, cannon, pastern and foot. From the side, a perpendicular line from the center of the elbow should equally divide the forearm, knee, fetlock and fall just back of the foot. From the side another perpendicular line from the center of the arm should touch the upper part of the forearm and fall touching the front of the knee and dividing the foot at top of hoof..... 10

Body

- Withers, muscled and well formed at the top..... 1
- Chest, deep, low, large heart girth..... 3
- Ribs, long, sprung, close... 1
- Back, long or short in proportion to breadth and size of horse, muscular... 3
- Loin, wide, short, thick.... 2
- Underline, long, flank let down..... 1

Hind Quarters.

- Hips, smooth, wide and level..... 1
- Croup, long, wide, muscular 1
- Tail, attached high, well carried..... ½
- Thighs, long, muscular, spread..... 1
- Quarters, heavily muscled, deep..... 1

Gaskins, long, wide and muscular..... 3
Hocks, clearly defined wide and straight..... 4
Cannons, short, large, wide and set back..... 1
Fetlocks, wide, straight.... ½
Pasterns, strong sloping, good length..... 2
Feet, medium, even size, dense horn, strong bars, absence of cracks, high and wide..... 2
Legs, a perpendicular line from the point of the buttock (viewing from behind) should equally divide the hock, cannon and feet. From the side a perpendicular line from the center of the hip joint should divide the gaskin in the center and strike the center of the foot. Another line from the point of the buttock should fall just back of and parallel to the cannon..... 10

Action.
Walk, quick, elastic, even.. 6
Trot or pace, regular, straight, high steps..... 11

Total 100.%.

Students in scoring horses will deduct whatever they believe to be right from the perfection and take the difference.

Current Literature

THE FORESTS OF THE PHILIPPINES

From the pen of Doctor H. N. Whitford, Chief, Division of Forest Investigation, Bureau of Forestry, and Associate Professor of Forest Botany in the University of the Philippines, there has just appeared as bulletin No. 10 of the Bureau of Forestry a comprehensive statement as to the forest resources of the Philippines, and as to work which the Bureau of Forestry has done up to this time in the study of forests and the forest products. With regard to forest resources of these Islands, and especially as to the composition of the Philippine forests, Dr. Whitford speaks with special authority, and has presented here the fruit of seven years of expert and undivided effort. In this work, he has had exceedingly capable assistance, especially from Forester H. M. Curran, Associate Professor of Forest Management.

Dr. Whitford classifies the forests of the Philippines under ten types as follows:

1	Lauan type.....	Dipterocarp types.
2	Lauan-hagachac type..	
3	Yacal-lauan type.....	
4	Lauan-apitong type...	
5	Tanguile-oak type.....	
6	Molave type.	
7	Pine type.	
8	Mangrove type.	
9	Beach type.	
10	Mossy type.	

Many of these types admit of finer division, a part of which is possible now, and a part of which can only be made as a result of still further study. From this table, and still more from the descriptions of the forests of the Islands, it appears that the real lumber resources are in overwhelming proportion furnished by the dipterocarp types. Thus it appears that out

of forty thousand square miles of merchantable forests 30,000 fall in the dipterocarp types, and that of a total estimated stand the 203,264 million board feet, 192,000 million are furnished by the dipterocarp forests. For market purposes, the dipterocarp lumber is of three types: the lauan, the apitong, and the yacal, of which the first is very much the most abundant.

The different types of forests are described both from the lumbermen's standpoint, as to the composition of the forest with regard to species and with regard to stand of trees of different sizes, and from the ecological side, in a discussion in which the author points out the climatic and local conditions which are likely to produce each type.

Dr. Whitford considers, and without doubt correctly, that the whole land area of the Philippines is potentially forest, and that all the grass and waste lands, as well as of course the cultivated lands, are such as the result of human activity, and that if left to themselves all such lands would return to forests. The stages through which this return might be expected to take place, and through which in many places it is found to be returning, are thoroughly explained. This is a matter of very great practical importance not merely because the grass and waste lands are at present useless, while they would be a source of wealth if they bore their natural forest cover, but because in their present condition they are both an obstruction and a menace to the best agricultural development.

The bulletin appears in two numbers, the first one on forest types and products, and the second on the principal forest trees. It is said that there are more than 2500 tree species in the Philippines of which more than 300 furnish lumber for the market. However, hardly 100 of these appear in such quantities that it is regularly possible to fill an order for them. The many fine cabinet woods, for which probably the Philippine lumber resources have so far been best known, receive due consideration; but it is fully demonstrated by the tables and duly emphasized in the text that these cabinet woods, unrivaled as they are in quality, are hardly more than a drop in the bucket of the Islands' forest resources.

All of the work of the Bureau of Forestry during the past decade on the properties and uses of woods, and the statistical studies which have been made of the forest products and their markets, are reproduced in condensed form in this bulletin. A chapter is given to the minor forest products, some of which are shown to be of very considerable and increasing importance. A compendium is also given of the laws and regulations governing the utilization of forest land and products. Of single features of this work foremost mention should be given to the illustrations. These number more than 100 full page plates. Some are photographs, in large part by the author, and others are drawings executed under his direction. Their standard, both in execution and in reproduction, is the highest possible, and they give the treatment of the individual tree species an unique value.

The work as a whole may be taken as a model of its kind, and the Director of the Bureau of Forestry, Professor Ahern, is to be congratulated on this presentation of what he has accomplished during the decade of his Bureau's service.

E. B. C.

THE USE OF LIME IN SOILS

Clay soils are a great part of the agricultural soils in the Philippines. They are so sticky when wet and so hard when dry, that it makes tillage difficult. To get rid of this undesirable condition, the use of lime in clay soils has been introduced, and found to be profitable.

Prof. Karutz of Cuba recently stated in the "Tropical Life" that lime seems

to be the cheapest kind of fertilizer; for it has the power of making the stored plant food in the soil available. It is used either to neutralize the acidity of the soil, or to set free the plant food in it.

In the soil, there are three principal kinds of lime to be used. They are carbonate of lime ($CaCO_3$), oxide of lime (CaO), and hydroxide of lime [$(Ca(OH)_2$.] These may be obtained from lime stones and from corals, which are abundant in the Philippines. Lime may be applied to the soil as pulverized lime or as burnt lime. Prof. Karutz recommends burnt lime; for it acts quicker and more intensively upon the soil than pulverized lime.

The amount of lime to be used on soils depends upon the condition of the latter. For citrus growers, he suggests ½ ton per acre or 5 lbs. per tree to be applied broadcast covering a circle of 5 ft. wide commencing 2 ft. from the trunk. For sugar cane fields, 1 ton per acre at least is recommended. Lime easily doubles the yield of sugar cane per acre on poor soil.

Lime may also be used as an insecticide, germicide and deodorizer. It is advisable to sprinkle powdered carbonate of calcium over fresh manure; it prevents ammonia from escaping and keeps flies away. Burnt lime is ineffective in this case; for it would help the liberation of ammonia.

Lime is itself a necessary food of all green plants. In fact, it is generally needed in larger quantities than phosphorus or potassium; but it is also far more abundant, and therefore not so generally needed as a fertilizer.

PASSION FRUIT CULTURE

Passiflora quadrangularis, known commonly as "rosas de pasión" and "granadilla," has attracted much attention at the College of Agriculture because of the remarkable productiveness of some vines in the nursery.

Some work has been undertaken on its propagation and it has been found that the vine can be easily propagated by seeds, cuttings and layering. With proper treatment, the seeds germinates in 10-15 days and the cuttings root in 6-10 days. Hard wood cuttings with short buds are preferable for propagation to soft wood cuttings or hard wood cuttings without buds; the latter die a few days after rooting.

Mr. J. Farrel, Orchard Supervisor of the Department of Agriculture of Victoria, Australia, has recently published a paper on Passion Fruit Culture.

Mr. Farrel treats of the plant as it is handled in a temperate region. The following extracts from his article published in a bulletin of the Department of Agriculture of Victoria are selected as applicable to the culture of these plants in the tropics.

The best soil is one that is deep, loose and of chocolate nature. The plants thrive best on new land.

Young plants are generally grown from seeds which may be sown thickly in seed beeds. When danger comes that the seedlings will crowd each other, they should be thinned, the weaker ones taken out so as to leave a space of about 3 inches between those remaining.

When the young seedlings are able to stand the condition outside, they may be transplanted to their permanent places. Post and wire trellises should be erected to support the young plants. The posts may be bamboo or timber. They should be strong and set in the ground at least 2 ft. deep. Passiflora quadrangularis is so heavy-growing a vine that it requires strong support. A good trellis should be 7 ft. high and 20 ft. long with three or four posts. Three vines may be planted along each trellis. If the cultivation i to be carried extensively, several trellise may be erected 15 ft. apart between th orws and 12 ft. apart in the row.

The soil around the young plants should be well worked so as to destroy weeds

and conserve moisture. Occasional watering is advantageous during dry weather.

Mr. Farrel recommends timely application of stable manure, bone dust and superphosphate fertilizer—around the plant, as necessary to maintain vigorous growth. Four pounds of stable manure should be applied around each plant at last once in six months. The land between the trellises should be plowed and harrowed thoroughly at least once in three months. The cultivation should be oftener in dry weather.

Passiflora edulis has been found to be subject to the attack of Collar Root (*Fusarium*). To free the plant from it, the stems should be kept clean; the diseased bark scraped off; and the plant, specially the attacked part, sprayed with Bordeaux mixture. Passiflora edulis has also suffered from brown rot of the leaf and fruit (*Glocosparium*). This disease can be checked by cutting and burning the attacked part and by the use of Bordeaux mixture.

Like *Passiflora edulis P. quadrangularis*, is very little attacked by insects.

SOME OF THE NEWER INSECTICIDES AND FUNGICIDES

Mr. B. G. Pratt of New York stated in the "Tropical Life" for May, 1911, that among the most notably new preparations for scale and soft bodied insects is Pratt's "Scalecide," which has been endorsed by the English Experiment Station at Cape Town, S. A., and also in Australia. It is one of the soluble and mixible oils containing a distinct fungicide, and has been found to be more effective on deciduous and citrus fruit trees than the lime sulphur washes.

Pratt's sulfocide or soluble sulphur is among the many new effective fungicides. It is not a lime sulphur, and contains no oil. It is said that up to this time it has not failed to control a fungus trouble. Pratt's "sulfocide" is thoroughly effective in dilution of 1 to 200 parts of water.

AGRICULTURAL STATISTICS IN JAPAN

The twenty-sixth statistical report of the Department of Agriculture and Commerce of Japan has just been received. Altogether it makes a volume of nearly 750 pages, chiefly tables, but including also Japanese and English text. A part of the information contained in this volume would make very interesting reading in the Philippines. The area devoted to rice in Japan in 1909 was 2,938,073.8 cho, the cho being very nearly equal to one hectare. The total production was approximately 84,000,000 hectoliters. The production per hectare has increased fairly steadily during the past decade, each of five years having shown a higher yield than any preceding year. The average production per hectare for the Empire was 24.4 hectoliters in 1900, and 29.8 hectoliters in 1909. Accordingly, while there has been no considerable change in the area in cultivation, there has been a very material increase in the total crop. This is an eloquent testimonial to Japanese progress in agricultural efficiency. Japan imported rice in 1909 to the value of 13,585,817 pesos, and exported it to the value of 5,867,290 pesos. The average value per hectoliter of the exported rice was ₱24.30, and of the imported, ₱17.08, the exported rice exceeding that imported in value by 42.24%. By growing rice of a superior quality, Japan manages to exchange a rice of its produce for a much larger quantity of the cheaper rice raised in southern Asia.

Full statistics are given as to the production of the various garden crops. Some idea of the importance of the garden industry of Japan can be gathered from the statement that there were produced, in 1909, 2,510,000 tons of radishes, 533,000 tons of taro, 3,467,000 tons of sweets potatoes, and 388,000 tons of egg plant. The

average production of sweet potatoes was 11,767 kilograms per hectare. The chief fiber plants of Japan are hemp, flax, and China grass. Of the latter, the area was only 1115.8 cho, and the average yield 534 kilograms per hectare.

The total area in mulberries in 1910 is given as 442,542.6 cho. The production of cocoons amounted to approximately 6,000,000 hectoliters, valued at about 131,000,000 pesos. A table of the total production of raw silk in the principal silk countries of the world shows that in 1909 Japan produced 8372 metric tons out of the total for the world of 24,510 tons.

Statistics on the animal industry of Japan show the following total and number of animals:

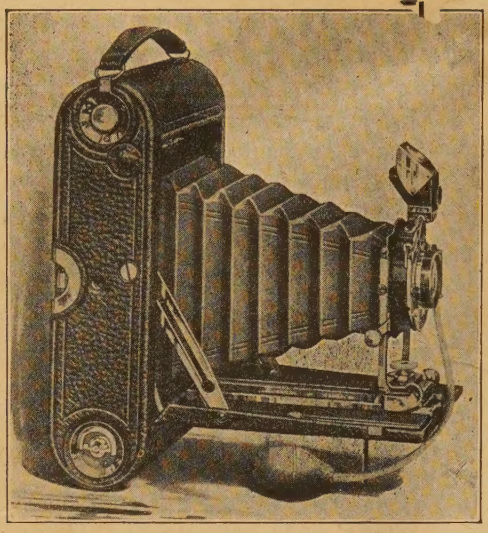
Cattle	1,350,404
Horses	1,551,156
Pigs	155,488
Goats	87,338
Sheep	3,411
Mature poultry	12,213,614
Young chickens	8,198,643

For each kind of animal, the Japanese statistics show the number of domestic, foreign and hybrid animals, male and female, and the number which were born and which died during the year in each of the forty-seven districts of the Empire; and in many cases the statistics are still more complete.

The tables as to the diseases of animals are presented with especially great detail showing for each disease which presented itself, and for each district, the number of males which were attacked, and the number which died and recovered respectively. The summary with regard to rinderpest is as follows:

Year	Died	Destroyed.
1901	7	446
1902	8	314
1903	13	153
1904	32	174
1905	41	1325
1906	—	—
1906 a	3	114
1907 b	6	322
1908 b	215	3116
1909 b	—	—

a. From April to December.
b. Calendar year.



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